

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Inquiry Concerning the Deployment of Advanced)	GN Docket No. 16-245
Telecommunications Capability to All Americans)	
in a Reasonable and Timely Fashion, and Possible)	
Steps to Accelerate Such Deployment Pursuant to)	
Section 706 of the Telecommunications Act of)	
1996, as Amended by the Broadband Data)	
Improvement Act)	

To: The Commission

COMMENTS OF O3B LIMITED

O3b Limited (“O3b”) welcomes the opportunity to submit these comments in response to the Commission’s Twelfth Broadband Progress Notice of Inquiry (“NOI”).¹

I. BACKGROUND

O3b is a global broadband satellite system in medium Earth orbit (“MEO”) that operates a constellation of twelve non-geostationary satellites that offers satellite capacity and high-speed connectivity to Internet Service Providers, telecom operators, and large enterprises and governments to enable fast, flexible, and affordable broadband connectivity in locations unserved or underserved by other broadband services. O3b provides middle mile capacity to large service providers that use O3b’s satellite capacity to provide service to end users, utilizing the 27.6-28.4 and 28.6-29.1 GHz band for its uplink and 17.8-18.4 and 18.6-19.1 GHz band for its downlink.² O3b’s MEO orbital altitude³ and high-power spot beam design allows the satellite system to use Ka-band frequencies to deliver very high-speed, low-latency broadband connectivity to large service providers and entities. In fact, the latency and data speeds provided over the O3b satellite system are comparable to terrestrial fiber services. O3b has been in full

¹ See generally *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, Twelfth Broadband Progress Notice of Inquiry, GN Docket No. 16-245, FCC 16-100 (rel. Aug. 4, 2016) (“NOI”).

² O3b does not sell directly to end users.

³ O3b’s satellites orbit the Earth at 8062 km while geosynchronous satellite systems orbit at 36000 km. The use of this lower altitude enables the O3b system to provide high-speed, low-latency services.

commercial service around the globe for two years, and customer demand for O3b's high-speed broadband services has been strong, such that O3b is expanding its capacity with the addition of eight satellites to its constellation.⁴

II. O3B'S LATENCY PERMITS IT TO SUPPORT REAL-TIME BROADBAND APPLICATIONS THAT ARE PART OF THE COMMISSION'S DEFINITION OF ADVANCED TELECOMMUNICATIONS CAPABILITY

The Commission asks for comment on whether the latencies for satellite systems can support interactive communications services such as Voice over Internet Protocol ("VoIP").⁵ O3b's MEO system allows end users to fully enjoy interactive broadband applications due to a latency as low as 120 ms.⁶ With this latency level, O3b's customers have demonstrated high customer satisfaction for key real-time broadband applications, including VoIP, cloud-based services, video and voice conferencing, video streaming, and real-time multiplayer video games.⁷

Because of its success in delivering broadband applications with a latency of 120-150 ms, O3b suggests that if the Commission decides to establish a latency benchmark, it should establish one that is higher than 100 ms. The Commission should base its latency threshold on the real world needs of advanced telecommunications applications. Systems with latencies higher than 100 ms already support real-time advanced telecommunications applications. The Commission should not undermine the provision of quality service to impose an artificial threshold.

The NOI itself cites to a number of resources that suggest a 100 ms latency threshold is not necessary for the provision of even the most latency-sensitive advanced telecommunications capabilities. For example, in its NOI, the Commission cites to an International Telecommunication Union study that states that consumers are very satisfied with the quality of VoIP calls with a mouth-to-ear latency above 200

⁴ See Caleb Henry, *New Satellites, New Antennas on the Horizon for O3b Networks*, Via Satellite (Aug. 18, 2015), <http://www.satellitetoday.com/telecom/2015/08/18/new-satellites-new-antennas-on-the-horizon-for-o3b-networks/>.

⁵ See NOI ¶ 30.

⁶ See O3b, *What is Network Latency and Why Does It Matter?*, http://www.o3bnetworks.com/wp-content/uploads/2015/02/white-paper_latency-matters.pdf (last accessed Sept. 2, 2016).

⁷ O3b customers have successfully demonstrated that the O3b satellite system supports cloud-based services such as Citrix and Sharepoint, video and voice conferencing services such as Skype and Blue Jeans, video streaming services such as Netflix and YouTube, and multi-player video games such as Halo and Call of Duty.

ms.⁸ Similarly, the NOI cites to Xbox Live customer support, which recommends a latency of 150 ms.⁹

Other resources not cited in the NOI also indicate that a 100 ms threshold is arbitrary. Skype recommends using an Internet connection with less than 200 ms of latency when using its VoIP and video conferencing service.¹⁰

None of these objective recommendations suggest that a 100 ms latency threshold is necessary to provide the services the Commission identifies as critical to advanced telecommunications capability. While latency can be a valid metric for the purpose of benchmarking advanced telecommunications capability, the Commission should not exclude systems that can support real-time broadband applications by imposing latency thresholds that are not truly necessary to enable high quality service to end users.

In O3b's view, the Commission would be in error if it established 100 ms latency as the benchmark when higher latencies are fully capable of supporting advanced telecommunications capability. O3b has demonstrated that commercial satellite systems with latencies higher than 100 ms can successfully deliver latency-sensitive interactive broadband applications to the satisfaction of end users. If the Commission is to set a latency threshold, it must be based on (i) whether latency impacts the delivery of service and (ii) demonstrated customer satisfaction.

III. O3B'S ROLE IN THE TELECOMMUNICATIONS ECOSYSTEM IN THE U.S. AND ABROAD

O3b operates key components of its terrestrial infrastructure in the U.S., including two of its nine gateways and its Network Operations Center. O3b uses these facilities to serve customers domestically and abroad.

The technical characteristics of the O3b system allow it to be flexible and serve many different types of customers with the same satellite constellation. In the U.S., a variety of customers with different needs

⁸ See NOI at nn.62-63; see also International Telecommunication Union, *Telecommunication Standardization Sector, Series G: Transmission Systems and Media, Digital Systems and Networks, G.114 3*, at 12, <http://www.itu.int/rec/T-REC-G.114-200305-I> (last accessed Sept. 2, 2016).

⁹ See NOI ¶ 31.

¹⁰ See *Skype Connect™ Requirements Guide*, Skype Limited (2011), <http://download.skype.com/share/business/guides/skype-connect-requirements-guide.pdf>.

have benefitted from the unique qualities of the O3b system. For example, O3b recently began service for its first U.S. offshore oil rig customer, providing a number of a benefits for energy customers. O3b's system facilitates critical voice communications and operational control systems, as well as providing improved data capabilities and allowing workers to stay better connected socially while stationed on offshore facilities.¹¹

O3b also added its second U.S. government customer in 2016, providing connectivity to the Department of Defense ("DoD") through SES Government Solutions. The new O3b contract will enable DoD users to transfer large files from remote locations in minutes instead of hours, use cloud-based applications and information throughout most of the service area, and stream High Definition video.¹²

In 2016, O3b began providing service to the National Oceanic and Atmospheric Agency ("NOAA"). NOAA, through SES Government Services, purchased O3b capacity to support the National Weather Service Office ("WSO") in Pago Pago, American Samoa.¹³ The WSO supports the National Weather Service's mission to provide weather, water, and climate data, forecasts, and warnings for the protection of life and property.¹⁴ O3b's high-speed, low-latency connection is essential for NOAA to update forecast models and issue safety warnings in near real-time, allowing the WSO to quickly transmit critical big data files to NOAA for rapid analysis.

O3b's first customer in the U.S., Royal Caribbean Cruise Lines ("Royal Caribbean"), uses O3b to provide high-speed internet connectivity to its passengers and crew. Royal Caribbean continues to expand

¹¹ See Press Release, O3b, RigNet and O3b Networks Close Offshore Deal to Bring Low Latency Connectivity to the Gulf of Mexico (Nov. 23, 2015).

¹² See Caleb Henry, *SES Government Solutions, Through O3b, Providing Connectivity to DOD*, Via Satellite (Aug. 29, 2016), <http://www.satellitetoday.com/publications/st/2016/08/29/ses-government-solutions-o3b-providing-connectivity-dod/>.

¹³ See Veronica Magan, *SES GS, NOAA Sign Agreement for O3b High Throughput Solution*, Via Satellite (Aug. 18, 2015), <http://www.satellitetoday.com/telecom/2015/08/18/ses-gs-noaa-sign-agreement-for-o3b-high-throughput-solution/>.

¹⁴ See *About NOAA's National Weather Service*, National Weather Service, <http://www.weather.gov/about> (last accessed Sept. 6, 2016).

the number of ships in its fleet with the O3b service, and each ship receives unparalleled performance and capacity from the O3b satellite system.¹⁵

O3b is developing expanded services for mobile applications. Currently, O3b is collaborating with ViaSat to bring a new service offering to the aeronautical market.¹⁶ Once available, O3b's aeronautical service is expected to have the same transformative effect as it has had on maritime and offshore connectivity, bringing unprecedented low-latency, high-throughput connectivity to a critical domestic market.

As a global service provider, O3b also provides broadband services to customers across five continents, connecting otherwise unconnected communities, enabling 3G/4G mobile services, supporting higher learning in remote locations,¹⁷ and helping to serve the growing needs of the energy industry.

O3b's unique combination of high-speed, low-latency connectivity and satellite reach makes it a compelling enabler for current generation mobile services. O3b provides capacity that meets the demands of 4G/LTE networks, allowing its clients to provide advanced mobile connectivity where terrestrial infrastructure is limited or unreliable. To date, O3b has allowed nearly twenty Mobile Network Operators ("MNOs") to provide service in hard-to-reach locales within a service area or further expanded service within a service area. O3b currently enables 4G/LTE services for ten MNOs in Asia, Africa, and South America.

O3b's system is similarly well-situated to serve the growing data demands of the energy industry. In addition to its newest energy customer in the Gulf of Mexico, O3b already serves energy customers in

¹⁵ See Press Release, O3b, O3b Connects Royal Caribbean "Smart Ship" Anthem of the Seas in the Mediterranean (June 17, 2015), <https://www.o3bnetworks.com/o3b-connects-royal-caribbean-smart-ship-anthem-of-the-seas-in-the-mediterranean/>.

¹⁶ See Peter B. de Selding, *ViaSat, Inmarsat agree: multi-system interoperability will come, seat-back video will go*, SpaceNews (Apr. 13, 2016), <http://spacenews.com/viasat-inmarsat-agree-multi-system-interoperability-will-come-seat-back-video-will-go/>.

¹⁷ See Press Release, O3b, O3b Satellite Network Brings Digital Parity to First University Customer (Mar. 17, 2015), <http://www.o3bnetworks.com/o3b-satellite-network-brings-digital-parity-to-first-university-customer/>.

Africa¹⁸ and the Middle East.¹⁹ As the energy industry's demands for data increase, O3b is ideally suited to provide its high-speed, low-latency capacity to additional providers.

IV. CONCLUSION

O3b encourages the Commission to consider innovative new telecommunications systems, such as O3b's satellite network, when developing policies and strategies for addressing the disparity between broadband deployment to urban and to rural and tribal communities. In developing policies to address broadband needs in unserved or underserved areas, any latency benchmark established should be higher than 100 ms, based on real world needs of advanced telecommunications applications, which are already being supported by systems with latencies higher than 100 ms. We appreciate the Commission's efforts to determine whether advanced telecommunications capability is being deployed to Americans in a reasonable and timely fashion, and O3b expects to continue to play a role in furthering that deployment.

Respectfully submitted,

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September 6, 2016

¹⁸ See Press Release, O3b, O3b Networks and Hermes Datacomms are changing the face of Energy communications in Africa (Nov. 13, 2014), <https://www.o3bnetworks.com/hermes-datacomms-and-o3b-changing-the-face-of-energy-communications-in-africa/>.

¹⁹ See Veronica Magan, *O3b, MEOSAT to Provide High Speed Connectivity to Oilfields in Southern Iraq*, Via Satellite (Apr. 14, 2015), <http://www.satellitetoday.com/telecom/2015/04/14/o3b-meosat-to-provide-high-speed-connectivity-to-oilfields-in-southern-iraq/>.